

Name: Dan Blumberg  
Organization: Lamont-Doherty Earth Observatory at Columbia University and Ben-Gurion University  
Address 1: 61 Rt 9W  
Address 2:  
City: Palisades  
State:  
Zipcode: 10964  
Country: USA  
Business Phone: 845-365-8817  
Other Phone: +972 -8-6472821  
Fax:  
Email: blumberg@bgu.ac.il  
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Presentation Title: The 2004 Sumatra tsunami event: Contribution of SRTM data to the analysis of devastation

Abstract: The 2004 Sumatra tsunami event: Contribution of SRTM data to the analysis of devastation

D. Blumberg<sup>1,2</sup>, D. Bach<sup>2,4</sup>, J. Weissel<sup>1,2</sup>, Y. Gorokhovich<sup>3</sup>, C. Small<sup>2</sup>, D. Balk<sup>3</sup>

<sup>1</sup>Ben-Gurion University, Be'er Sheva, Israel

<sup>2</sup>Lamont-Doherty Earth Observatory, Columbia University, Palisades NY

<sup>3</sup>Center for International Earth Science Information Network, Columbia University

<sup>4</sup>Department of Earth and Environmental Science, Columbia University

A disastrous tsunami affecting coastal populations of the northern Indian Ocean occurred on December 26th 2004, following a mega-thrust earthquake ( $M_s > 9.0$ ) at the India-Burma plate interface of the Sumatra-Andaman Islands subduction zone. The Indonesian Island of Sumatra was the hardest hit by the tsunami. SRTM and other high quality radar data fill a critical data gap in evaluating regions at risk. SRTM data are currently being used to study how the populations are distributed with respect to elevation and distance from the shoreline in devastated areas. These data are being compared with optical remote sensing land surface change analyses derived from Landsat ETM+ imagery, which delineate the relationship between elevation, slope and aspect of inundated regions in northwest Sumatra. To evaluate the impact of the tsunami we have processed SRTM C-band and X-band DEMs. The C-band ( $\sigma = 5.8\text{cm}$ ) DEM with a 3 arc-sec ( $\sim 90\text{m}$ ) spatial resolution covered the entire land areas whereas the X-band ( $\sigma = 3.1\text{cm}$ ) coverage had a higher 1 arc-sec resolution ( $\sim 30\text{m}$ ) but had incomplete coverage. A correlation has been established between elevation contours and the extent of inundation within the region;

however, the accuracy of the SRTM height data requires further local verifications. As part of the verification, the two SRTM datasets were compared for the region of interest and differences were found. While both datasets followed very similar topographic trends they differed significantly along the western coast of Sumatra. Transects from the mountainous area to the coast were extracted showing elevation differences of up to 32 m primarily in the coastal region and feathering to near zero inland. The reason for the difference between the datasets is currently being investigated and is potentially attributed to differences in the geodetic datum used for each.